

Empathy inhibits aggression in competition

Stanger, Nicholas; Kavussanu, Maria; McIntyre, David; Ring, Christopher

DOI:

[10.1123/jsep.2014-0332](https://doi.org/10.1123/jsep.2014-0332)

License:

None: All rights reserved

Document Version

Peer reviewed version

Citation for published version (Harvard):

Stanger, N, Kavussanu, M, McIntyre, D & Ring, C 2016, 'Empathy inhibits aggression in competition: the role of provocation, emotion, and gender', *Journal of Sport and Exercise Psychology*, vol. 38, no. 1, pp. 4-14.
<https://doi.org/10.1123/jsep.2014-0332>

[Link to publication on Research at Birmingham portal](#)

Publisher Rights Statement:

Eligibility for repository: Checked on 3/3/2016

General rights

Unless a licence is specified above, all rights (including copyright and moral rights) in this document are retained by the authors and/or the copyright holders. The express permission of the copyright holder must be obtained for any use of this material other than for purposes permitted by law.

- Users may freely distribute the URL that is used to identify this publication.
- Users may download and/or print one copy of the publication from the University of Birmingham research portal for the purpose of private study or non-commercial research.
- User may use extracts from the document in line with the concept of 'fair dealing' under the Copyright, Designs and Patents Act 1988 (?)
- Users may not further distribute the material nor use it for the purposes of commercial gain.

Where a licence is displayed above, please note the terms and conditions of the licence govern your use of this document.

When citing, please reference the published version.

Take down policy

While the University of Birmingham exercises care and attention in making items available there are rare occasions when an item has been uploaded in error or has been deemed to be commercially or otherwise sensitive.

If you believe that this is the case for this document, please contact UBIRA@lists.bham.ac.uk providing details and we will remove access to the work immediately and investigate.

**Empathy Inhibits Aggression in Competition: The Role of
Provocation, Emotion and Gender**

Journal:	<i>Journal of Sport and Exercise Psychology</i>
Manuscript ID	JSEP.2014-0332.R3
Manuscript Type:	Article
Keywords:	Anger, Experiment, Guilt, Morality, Perspective taking

SCHOLARONE™
Manuscripts

Peer Review

Running HEAD: EMPATHY, EMOTION AND AGGRESSION

1
2
3
4
5
6
7
8
9
10
11
12

Empathy Inhibits Aggression in Competition:
The Role of Provocation, Emotion, and Gender

Third Revision Submitted: October 12, 2015

Abstract

Although the empathy-aggression relationship has been well documented, research has yet to establish whether emotions mediate and gender moderates this relationship in athletes, under conditions of low and high provocation. In this experiment, we assigned team-sport athletes to either a high ($n = 40$) or a low ($n = 40$) empathy group, and asked them to compete in a reaction-time task against a (fictitious) opponent, under conditions of low and high provocation. Empathy reduced aggression (i.e., intensity of electrical shock administered to the opponent) at low provocation in men, and at both low and high provocation in women. Guilt mediated the effect of empathy on aggression at low provocation in men; anger did not mediate any effects of empathy on aggression. Our findings indicate that the inhibitory effect of empathy on aggression and the mediating role of guilt are moderated by provocation and gender.

Keywords: anger, experiment, guilt, morality, perspective taking.

1 Empathy Inhibits Aggression in Competition:

2 The Role of Provocation, Emotion, and Gender

3 Aggression, defined as verbal or physical behavior intended to harm another individual,
4 who is motivated to avoid such treatment (Baron & Richardson, 1994), can cause significant
5 psychological and physical harm to its recipients. For example, a high tackle or sucker punch
6 in soccer or rugby could seriously injure a player and end his or her participation in sport.
7 Aggression could also negatively affect performance by distracting attention from the task or
8 inviting sanction from the officials (e.g., being sent off). Given the potential adverse
9 consequences of aggression, identifying factors that reduce this behavior in sport is a
10 significant research endeavor. The main aim of this research was to investigate the effect of
11 empathy on aggression in athletes and to examine whether provocation and gender moderate,
12 and emotions mediate, this effect.

13 **Empathy and Aggression**

14 Empathy has been defined as an other-oriented emotional response that is congruent
15 with another person’s perceived welfare (Batson, Early, & Salvarani, 1997). Empathy can be
16 elicited via perspective taking by imagining how the other person feels (Batson et al., 1997;
17 Hoffman, 2000). Several theorists have suggested that empathy should inhibit aggression
18 (e.g., Eisenberg, 2000; Feshbach, 1975; Hoffman, 2000). Specifically, when individuals
19 adopt the perspective of others and imagine how others feel, they are less likely to engage in
20 aggressive behavior that may elicit distress in another person (Eisenberg, 2000). Indeed,
21 empathy has been negatively associated with aggression in numerous cross-sectional studies
22 (e.g., Jolliffe & Farrington, 2004; Miller & Eisenberg, 1988; Vachon, Lynam, & Johnson,
23 2014) and some experiments (e.g., Phillips & Giancola, 2007). In the sport context, empathy
24 has been inversely linked to antisocial behavior (Kavussanu & Boardley, 2009; Kavussanu,
25 Stamp, Slade, & Ring, 2009; Kavussanu, Stanger, & Boardley, 2013). However, only one

EMPATHY, EMOTION AND AGGRESSION

4

experiment has been conducted in athletes. Although results showed that empathy reduced males' reported likelihood to aggress toward an opponent in sport (Stanger, Kavussanu, & Ring, 2012), researchers did not measure actual aggression. Therefore, there is still a need to experimentally investigate the effect of empathy on actual aggressive behavior in athletes.

Empathy has the potential to attenuate aggression in sport, a context in which individuals could be aggressive in their efforts to outperform others (see Bredemeier & Shields, 1986). Indeed, athletes report that aggressive and antisocial acts against competitors are more acceptable and frequent in sport than in other contexts (e.g., Kavussanu, Boardley, Sagar, & Ring, 2013; Kavussanu & Ring, 2015). Empathy could attenuate aggression in athletes by promoting consideration of others' feelings and welfare during competition. People can also behave impulsively and thereby act aggressively due to elevated arousal (Zillmann, 1988), which can be increased by competition (e.g., Cooke, Kavussanu, McIntye, & Ring, 2013). Perspective taking may strengthen one's cognitive ability to counteract the arousal that could lead to aggression (Richardson, Hammock, Smith, Gardner, & Signo, 1994; Zillmann, 1988), thereby attenuating aggression in athletes during competition.

Provocation and Gender

Provocation, which refers to any action judged to be aversive, eliciting negative affect such as anger (e.g., Berkowitz, 1989), can lead to reactive aggression in sport (Maxwell, 2004). Provocation has been positively associated with aggression in athletes (e.g., Maxwell, 2004) and has the potential to negate the inhibitory effects of empathy on aggression (e.g., Phillips & Giancola, 2007). Specifically, at low-to-moderate levels of provocation (e.g., low-to-moderate arousal or threat), perspective taking can reduce aggression, whereas at high provocation (e.g., high arousal or threat) the ability of perspective taking to reduce aggression can become greatly impaired (Richardson et al., 1994; cf. Zillman, 1988). Medium-to-high contact team sports, where interaction and physical contact among opponents are

1 unavoidable, provide ample opportunities for provocation. For example, players can use
2 excessive physical force to win the ball (e.g., pushing, elbowing, or kicking) or mock
3 opponents to get an edge over them during competition. Athletes, who compete in high
4 contact team sports, tend to experience higher provocation while playing sport (Maxwell,
5 Vissek, & Moores, 2009). Thus, investigating aggression in athletes from a variety of team
6 sports under different conditions of provocation is important.

7 A consistent research finding concerns gender differences in empathy and aggression:
8 Women report higher empathy than men (Eisenberg & Lennon, 1983; Kavussanu et al.,
9 2009), and men engage in more physical aggression than women, particularly when
10 aggression is directed toward an individual of the same gender (Archer, 2004; Bettencourt &
11 Miller, 1996). Gender could moderate the effect of empathy on aggression in competitive
12 contexts. Based on the social roles theory (Eagly, 1987), men's desire for competence and
13 superiority may increase their competitiveness and consequently their aggression in
14 competitive contexts, compared to women, whose social role of being oriented around more
15 communal traits (e.g., caring for others) is more congruent with empathy. Accordingly, men
16 may be more likely to experience higher arousal and focus on their own needs in competitive
17 contexts compared to women. Thus, the inhibitory effect of empathy on aggression may be
18 weaker in men compared to women, during competition.

19 Past research has also shown that the gender difference in aggression is markedly
20 attenuated by provocation (see Bettencourt & Miller, 1996). Provocation provides
21 justification for aggression that liberates women from the usual constraints evoked by gender
22 role norms (Bettencourt & Miller, 1996). In one experiment, empathy reduced aggression at
23 low but not high provocation in men, and at high but not low provocation in women, during a
24 competitive task (Phillips & Giancola, 2007). These findings indicate that the effect of
25 empathy on aggression may vary depending on gender and levels of provocation.

1 **Empathy and Emotion**

2 Although empathy has been negatively associated with aggression in cross-sectional
3 and experimental studies, the process through which this occurs has not been investigated. A
4 variable that could explain this effect is the emotion of guilt, which can be experienced as a
5 result of the empathic feelings for someone in distress following the realization of being
6 personally responsible for their distress (Hoffman, 2000). Guilt is an adaptive emotion
7 characterised by reparative action tendencies (i.e., making amends) following a transgression
8 (Tangney, Stuewig, & Mashek, 2007) and is assumed to play a key role in regulating
9 aggression. For instance, if one behaves aggressively and feels guilty as a response, they are
10 less likely to engage in such acts in the future. Thus, people refrain from aggression because
11 of anticipated affective sanctions if they were to engage in this or any other unethical
12 behavior (Bandura, 1991). Studies have revealed an inverse relationship between proneness
13 to experience guilt in social situations and aggression (e.g., Stuewig, Tangney, Heigel, Harty,
14 & McCloskey, 2010).

15 Empathy has been consistently and positively linked with guilt (e.g., Leith &
16 Baumeister, 1998; Stuewig et al., 2010). In past research, situational guilt mediated the
17 negative relationship between perspective taking and interpersonal conflict (Leith &
18 Baumeister, 1998), while anticipated guilt mediated the negative effect of empathy on male
19 athletes' reported likelihood to aggress in sport (Stanger et al., 2012).

20 The negative relationship between empathy-based guilt and aggression may vary
21 depending on provocation. When provoked, people may blame the provocateur and retaliate
22 aggressively without feeling guilty about their actions (Bandura, 1991). Indeed, research has
23 revealed that athletes report anticipate feeling less guilt if they had committed an aggressive
24 act when they imagine themselves in a situation where they have been provoked (e.g.,
25 Stanger, Kavussanu, Boardley, & Ring, 2013). However, it is not known whether guilt

mediates the inhibitory effect of empathy on aggression, when provoked during competition. Provocation could differentially influence guilt, and this could explain why the effect of empathy on aggression is negated following provocation.

An emotion that has been positively associated with aggression is anger (e.g., Novaco, 1997), which is evoked by events that are interpreted as an offense. One of these events is provocation, which has been consistently linked to increased anger (Bond & Lader, 1986; Mohr, Howells, Gerace, Day, & Wharton, 2007; Parrott, Zeichner, & Stephens, 2003). Perspective taking may reduce anger following provocation by helping maintain a higher level of cognitive functioning; this, in turn, may reduce aggression (Mohr et al., 2007; cf. Zillmann, 1988). Research has reported an inverse relationship between perspective taking and likelihood to experience anger following an interpersonal provocation (Mohr et al., 2007). Given that empathy has been inversely associated with anger, and that anger has been positively linked to aggression, empathy may reduce aggression via its effect on anger.

The Present Research

In sum, empathy has been inversely associated with aggression (e.g., Miller & Eisenberg, 1988; Phillips & Giancola, 2007). However, to date, only one experiment has examined the effect of empathy on aggression in athletes; this experiment investigated reported likelihood to aggress in a hypothetical situation (Stanger et al., 2012) rather than *actual* aggression. Moreover, no study has examined the process through which empathy inhibits aggression; guilt and anger are likely mediators. Finally, we do not know whether the effect of empathy on aggression is consistent for male and female team-sport players when responding to provocation. The first purpose of this experiment was to examine whether empathy inhibits athletes' aggression during a competitive task under conditions of low and high provocation and whether these effects are moderated by gender. A second

purpose was to investigate whether guilt and anger mediate the effects of empathy on aggression and whether these effects are moderated by gender.

Method

Experimental Design

We used a mixed-factorial design, with empathy group (low, high) and gender as between-subjects factors and provocation (low, high) as a within-subjects factor. Each empathy group consisted of 20 men and 20 women.

Participants

Eighty undergraduate students (40 men and 40 women), who competed in a team sport at the time of data collection, with a mean age of 19.49 ($SD = 1.13$) years took part in the experiment. Participants competed in soccer ($n = 30$), field hockey ($n = 16$), rugby ($n = 15$), netball ($n = 8$), American football ($n = 4$), basketball ($n = 3$), korfbal ($n = 2$) and lacrosse ($n = 2$); they had competed at international/ national (9%), regional/ county (50%) and club (41%) levels for an average of 7.69 ($SD = 3.72$) years.

Aggression Task

We used the Taylor Aggression Paradigm (TAP; Taylor, 1967), a well-established paradigm (e.g., Giancola & Parrott, 2008) that enables researchers to study provoked and unprovoked aggression in a competitive context. Participants were asked to compete against an opponent in a series of reaction time trials, where winning and losing were predetermined. Unbeknownst to participants, the opponent was fictitious. On winning trials, participants administered an electrical shock of their chosen intensity to their (fictitious) opponent, whereas on losing trials, they received an electrical shock by their opponent; the shock was administered to elicit provocation. The order of events on this task is described below.

First, participants were shown a signal on a light display box, cuing them to select the shock intensity that they wished to administer to their opponent, if they were to win the trial,

by pressing one of ten buttons, numbered between 1 (*low intensity*) and 10 (*high intensity*). Between 6 and 7 seconds after their shock selection, participants were presented with a light stimulus indicating that they should press the response button as fast as possible. Four seconds later, they were shown a “Feedback” signal, which indicated whether they had won or lost that trial. When they won, participants were reminded of the shock intensity they selected for their opponent; when they lost, they were informed of the shock intensity selected by their opponent that they were going to receive shortly. The shock was administered to the participant or (fictitious) opponent 10 seconds following feedback, and the next trial commenced 10 seconds later.

Participants performed two blocks of 16 trials, separated by a 5-minute interval: Block 1 was low provocation, and block 2 was high provocation. Participants received shock intensities between 1 and 4 ($M = 2.5$) during the low provocation block and between 7 and 10 ($M = 8.5$) during the high provocation block. In each block, participants “won” 8 trials and “lost” 8 trials. Two transition trials were included at the start of the second block (which were not analysed), where participants received shock intensities of 5 and 6 to smoothen the transition between low and high provocation (Giancola, 2003). Thus, the order of trials that were won and lost and the shock intensity administered by the “opponent” was fixed across all participants in each block. The low-high sequence of provocation was used to increase the external validity of the task by simulating the rise of interpersonal provocation in real-life contexts and is in line with previous research (e.g., Giancola, 2003). During the aggression task, shocks ranged from 1 to 10, corresponding to participants’ pain threshold that ranged from 55% to 100% (see Giancola, 2003).

Measures

Aggression. We used two measures of aggression: unprovoked (or proactive) aggression, which was operationalized as the shock intensity chosen by the participant on the

EMPATHY, EMOTION AND AGGRESSION

10

1 first trial, that is, before receiving any shocks; and provoked (or reactive) aggression, which
2 was operationalized as the shock intensity chosen on subsequent trials. We calculated
3 separate scores for provoked aggression at low and high provocation by computing the mean
4 shock intensity selected for each block.

5 **Guilt.** Guilt was measured after each block of trials on a Likert scale anchored by 1
6 (*not at all*) and 5 (*extremely*). Participants were asked the extent to which they felt guilt
7 about shocking their opponent (on winning trials) using the 5-item subscale from the State
8 Shame and Guilt Scale (SSGS; Marschall, Saftner, & Tangney, 1994). An example item is “I
9 felt remorse”. Marschall et al. (1994) provided psychometric support for this scale ($\alpha = .82$).
10 Its internal consistency was good for the first ($\alpha = .77$) and second ($\alpha = .79$) block of trials.

11 **Anger.** We used both self-report and physiological measures of anger. Supplementing
12 self-reports with concurrent physiological measures can provide corroborative evidence for
13 the presence of specific emotions (Cacioppo, Berntson, Larsen, Poehlmann, & Ito, 2000),
14 because physiological measures can capture fleeting emotional experiences, are objective,
15 and sensitive to changes in psychological states. Physiological responses were assessed
16 around feedback, as this was when participants were reminded or informed of the shock level
17 chosen by the “winner” of that trial, and, therefore, where we expected that emotional
18 responses would be most pronounced. Two autonomic responses that index emotional
19 arousal elicited by anger are skin conductance (i.e., moisture level of the skin reflective of
20 sweat gland activity) and heart rate (e.g., Stemmler, 2010). As both responses increase along
21 with reported anger in reaction to provocation (e.g., Bond & Lader, 1986; Hoaken, Campbell,
22 Stewart, & Phil, 2003), they were interpreted as indices of anger.

23 **Self-reported anger.** Self-reported anger was measured after each block of trials using
24 the anger subscale of the Sport Emotion Questionnaire (Jones, Lane, Bray, Uphill, & Catlin,
25 2005). Participants indicated the degree to which they felt “angry”, “annoyed”, “irritated”

1 and “furious” about receiving shocks on losing trials after each block. They responded on a
2 5-point Likert scale anchored by 1 (*not at all*) and 5 (*extremely*). Jones et al. (2005) provided
3 psychometric support for this scale ($\alpha = .84$). Its internal consistency for the first ($\alpha = .83$)
4 and second ($\alpha = .92$) block was very good.

5 **Heart rate.** To assess heart rate, the electrocardiogram (ECG) was measured using
6 silver/silver chloride electrodes (Cleartrace, ConMed) in a modified chest configuration. The
7 electrocardiographic signal was amplified ($\times 5000$) and filtered (1–100 Hz) using a Grass
8 LP511 AC amplifier. Heart rate (beats per minute; bpm) was derived from the intervals
9 between R-waves of the ECG and computed in half-second bins. We calculated the mean
10 heart rate 2-4 seconds (peak response, see Figure 1) after receiving feedback about losing
11 minus their instantaneous heart rate when feedback was given.

12 **Skin conductance.** Skin conductance was measured using silver / silver chloride
13 reusable finger electrodes (Grass, F-EGSR) secured to the medial phalanx of the index and
14 middle finger of the left hand. The skin conductance signal was amplified ($\times 1000$) and
15 filtered (1–100 Hz) using a Grass SCA1/T9 coupler and LP122 AC/DC amplifier. Skin
16 conductance response (micro Siemens μS) to feedback was calculated as the peak skin
17 conductance 1-9 s after receiving feedback minus peak skin conductance 1-4 s before
18 feedback. Both physiological signals were digitized at 2500 Hz with 16-bit resolution (Power
19 1401, Cambridge Electronic Design) using Spike2 software (Cambridge Electronic Design).

20 **Dispositional Empathy**

21 Dispositional empathy was measured using the 7-item perspective taking and empathic
22 concern subscales from the Interpersonal Reactivity Index (Davis, 1980). Participants were
23 asked to rate how well the items described them, on a scale with anchors of 1 (*does not*
24 *describe me well*) and 5 (*describes me very well*). Example items are “before criticizing
25 somebody, I try to imagine how I would feel if I were in their place” for perspective taking,

and “I would describe myself as a pretty soft-hearted person” for empathic concern. In line with previous research (e.g., Kavussanu et al., 2009, 2013), a mean empathy score was calculated using all the items from the two-subscales and has shown very good internal consistency ($\alpha = .77$ to $.85$). The internal consistency was good in the current study ($\alpha = .84$).

Procedure and Empathy Manipulation

First, the protocol was approved by the university ethics committee. Participants were randomly assigned to one of the two empathy groups and were tested individually. Upon arrival at the laboratory, they were told that the study was concerned with the influence of competition on reaction time. Following consent, they completed a pre-experimental baseline measure of dispositional empathy to check that there were no group differences in this variable in case it had a confounding effect on the empathy manipulation or aggression during the task. After instrumentation, the participant’s pain threshold was determined; we used an ascending method of limits, in which a series of 500 μ s square wave electrocutaneous stimulations increased by 0.5 mA until participants reported the shock as painful, followed by an up-down staircase method around the reported painful stimulus (Edwards, Ring, McIntyre, & Carroll, 2001). The stimulus was delivered to the dorsal surface of the right forearm, 20 cm above the wrist-fold using a constant current stimulator (DS7A, Digitimer) and a nociception-specific electrode (Kaube, Katsavara, Käufer, Diener, & Ellrich, 2000).

Next, participants were familiarised with the aggression task by completing eight practice trials, and they were informed that they had to wait until their “opponent” was ready to start the task. During this time, they were administered one of two empathy manipulations, adapted from previous research (Batson et al., 1997). Participants in the high-empathy group were instructed: “*Imagine how your opponent feels about what you do to him/her and how the shocks affect him/her. Try to feel the full impact of what this person is going through and how he/she feels as a result.*” Participants in the low empathy group were instructed: “*Take*

1 *an objective perspective toward what happens. Try not to get caught up in how your*
2 *opponent might feel: just remain objective and detached.”* Participants confirmed that they
3 understood the instructions before beginning the task. To reduce potential experimenter bias
4 effects on participant responses, participants read the empathy manipulation, and the
5 aggression task was run automatically by the computer with no experimenter involvement.

6 As the sex of the opponent may influence how aggressive participants are during the
7 task (Archer, 2004), and athletes typically compete in same-sex teams, participants were told
8 that they were competing against someone of the same sex, located in an adjacent room.
9 During the 5-minute interval between blocks, and at the end of the second block of trials, they
10 completed self-report measures of guilt (Marschall et al., 1994) and anger (Jones et al., 2005).
11 We measured guilt with respect to winning trials (i.e., when participants shocked their
12 opponent), and anger with respect to losing trials (i.e., when participants were shocked),
13 because aggressive actions performed by us may elicit guilt, whereas those performed against
14 us may elicit anger (Prinz, 2006). Finally, participants were interviewed to examine the
15 effectiveness of the deception and debriefed.

16 **Deception manipulation.** A series of steps were taken to convince participants that
17 they were competing against an opponent. Another experimenter entered the laboratory
18 twice: (a) to confirm that the “other participant” had arrived and (b) to borrow some
19 equipment and provide an update on the progress of the instrumentation of the “other
20 participant”. Participants were interviewed for suspicion about the aims of the study and the
21 fictitious nature of the opponent. Six (4 men and 2 women) of the eighty-six participants
22 suspected that they were not competing against a real opponent, and, therefore, their data
23 were not analysed or reported here, leaving a sample of 80 participants.

24 **Results**

25 **Effects of Empathy on Aggression**

Prior to the main analyses, we examined whether participants in the two empathy groups differed in dispositional empathy (Davis, 1980). A 2 Group (low empathy, high empathy) Analysis of Variance (ANOVA) verified that there were no group differences in this variable, $F(1, 76) = 1.67, p = .20, \eta_p^2 = .02$. Below we have reported analyses that pertain to the effect of manipulated empathy on unprovoked and provoked aggression.

Unprovoked aggression. We examined the effect of empathy on unprovoked aggression, using a 2 Group (low empathy, high empathy) \times 2 Gender (men, women) ANOVA. Gender was included in this and subsequent analyses to determine whether the effect of empathy was uniform across gender. This analysis revealed main effects for empathy group, $F(1, 76) = 4.70, p = .03, \eta_p^2 = .06$, and gender, $F(1, 76) = 10.09, p < .01, \eta_p^2 = .12$, on unprovoked aggression. The high empathy group ($M = 3.38, SD = 2.16$) was less aggressive than the low empathy group ($M = 4.45, SD = 2.49$), and men were more aggressive ($M = 4.70, SD = 2.47$) than women ($M = 3.13, SD = 2.02$). There was no group \times gender interaction, $F(1, 76) = 0.02, p = .88, \eta_p^2 = .00$.

Provoked aggression. We examined the effect of empathy on aggression at different levels of provocation, using a 2 Group \times 2 Gender \times 2 Provocation (low, high) ANOVA. We found main effects for group, $F(1, 76) = 11.54, p < .001, \eta_p^2 = .13$, gender, $F(1, 76) = 19.54, p < .001, \eta_p^2 = .21$, and provocation, $F(1, 76) = 189.96, p < .001, \eta_p^2 = .71$, as well as a Group \times Gender \times Provocation interaction, $F(1, 76) = 4.02, p < .05, \eta_p^2 = .05$ (see Figure 2). Post-hoc planned contrasts showed that at *low provocation*, both men ($p < .02$) and women ($p < .02$) in the high empathy group were less aggressive than those in the low empathy group; men were also overall more aggressive than women ($p < .01$). However, at *high provocation*, men were equally aggressive in the two groups; thus, empathy had no effect on men at high provocation. In contrast, women in the high empathy group were less aggressive than women in the low empathy group ($p < .01$); men were more aggressive than women only in the high

($p < .001$) empathy group. Thus, at low provocation, empathy affected aggression in men and women similarly, but at high provocation empathy affected aggression only in women¹.

Effects of Empathy on Emotion

Guilt. A 2 Group \times 2 Gender \times 2 Provocation ANOVA on guilt revealed main effects for group, $F(1, 75) = 6.86, p = .01, \eta_p^2 = .08$, and provocation, $F(1, 75) = 22.83, p < .001, \eta_p^2 = .23$, but not gender. Specifically, the high empathy group ($M = 1.68, SD = 0.46$) experienced more guilt over shocking their opponent than the low empathy group ($M = 1.42, SD = 0.41$). In addition, feelings of guilt were higher during low provocation ($M = 1.67, SD = 0.56$) than high provocation ($M = 1.42, SD = 0.46$). There were no interaction effects.

Anger. A 2 Group \times 2 Gender \times 2 Provocation, Multivariate Analysis of Variance (MANOVA) on the three indices of anger revealed no effect of empathy. There was a main effect for provocation, $F(3, 73) = 16.51, p < .001, \eta_p^2 = .40$. Follow-up ANOVAs showed that provocation affected reported anger, $F(1, 75) = 18.88, p = .001, \eta_p^2 = .20$, which was more intense during high ($M = 2.23, SD = 1.11$) than low ($M = 1.85, SD = 0.79$) provocation; heart rate, $F(1, 75) = 10.63, p = .002, \eta_p^2 = .12$, which became faster following feedback during high ($M = 2.10, SD = 4.04 \text{ bpm}$) than low provocation ($M = 0.99, SD = 3.63 \text{ bpm}$); and skin conductance, $F(1, 75) = 12.74, p = .001, \eta_p^2 = .15$, which was greater following feedback during high ($M = 0.05, SD = 0.25 \mu\text{S}$) than low ($M = -0.04, SD = 0.17 \mu\text{S}$) provocation². Thus, all indices of anger were greater at high than low provocation.

Mediation Analysis

Given that empathy did not influence anger, this emotion was not considered a mediator. As we found main effects for empathy and provocation on guilt and aggression, and an empathy \times gender \times provocation interaction on aggression, we conducted mediation analysis at low and high provocation, separately. To examine whether guilt mediated the effect of empathy on aggression, we performed bootstrapping, which is one of the most

powerful methods that best controls for Type I error, when testing for indirect effects (Hayes, 2009; Preacher & Hayes, 2004), using the PROCESS macro for the Statistical Package for the Social Sciences (SPSS) v2.1 (Hayes, 2013). When the confidence interval for an indirect effect does not contain zero, there is evidence of mediation. Each model was run with 5,000 bootstrapped samples of the indirect effect of guilt for which we report the 95% bias corrected bootstrap confidence intervals (CI).

In the total sample, the indirect effect of guilt was significant at low provocation (point estimate = -0.41 , 95% CI = $-0.95, -0.10$), but not at high provocation (point estimate = -0.19 , 95% CI = $-0.68, 0.01$). We examined whether the indirect effect of guilt was moderated by gender at low and high provocation, by calculating the index of moderated mediation (available in the PROCESS macro for SPSS; Hayes, 2013), which equates to the difference between the two conditional indirect effects of guilt for men versus women (Hayes, 2015). If the confidence interval of this index excludes zero, there is evidence of moderated mediation. At low provocation, a significant indirect effect for guilt was found in men as shown in Figure 3A (point estimate = -0.75 , 95% CI = $-1.71, -0.24$), but not in women (Figure 3B) (point estimate = -0.10 , 95% CI = $-0.73, 0.06$); the index of moderated mediation for this model was significant (0.64 , 95% CI = $0.01, 1.63$). At high provocation, there was no significant indirect effect of guilt for men (point estimate = -0.29 , 95% CI = $-1.33, 0.02$) or women (point estimate = -0.08 , 95% CI = $-0.79, 0.13$); the index for moderated mediation was not significant (0.21 , 95% CI = $-0.39, 1.21$).

Discussion

Previous research has shown that empathy inhibits aggression and that guilt and anger have been linked to both empathy and aggression (e.g., Miller & Eisenberg, 1988; Mohr et al., 2007; Stanger et al., 2012; Stuewig et al., 2010). However, the effect of empathy on athletes' *actual* aggression while engaging in competition has not been examined. In this

1 experiment, we investigated the effect of empathy on aggression in athletes during a
2 competitive motor task. We also examined whether gender and provocation moderate this
3 effect, and whether guilt and anger act as mediators in this process.

4 **The Effects of Empathy on Aggression**

5 In line with our hypothesis, empathy reduced participants' aggression (both unprovoked
6 and provoked) during the reaction-time task. The effect was small-to-medium for
7 unprovoked aggression and medium for provoked aggression. These findings are consistent
8 with previous research investigating the relationship between trait empathy and antisocial
9 behavior in sport (e.g., Kavussanu & Boardley, 2009; Kavussanu et al., 2009, 2013). Our
10 findings also support and extend the results of another experiment that has found a link
11 between empathy and athletes' reported likelihood to aggress (Stanger et al., 2012), by
12 showing that empathy can attenuate *actual* aggression during competition.

13 Our findings support previous research showing that perspective taking can play an
14 important role in reducing aggression towards out-group members in sport, such as opponents
15 (see Decety & Cowell, 2014). Similar to Phillips & Giancola (2007), we found that empathy
16 reduced aggression at low provocation, but not high provocation, in men. However, although
17 Phillips and Giancola (2007) found that empathy reduced aggression in women only at high
18 provocation, we found that empathy reduced aggression in women, at both low and high
19 provocation. This slight discrepancy in the findings between the two studies may be due to
20 the composition of the two samples, which may have led to variation in aggression.
21 Specifically, Phillips and Giancola (2007) found that female university psychology students,
22 who were presumably not all athletes, selected lower intensity shocks, at low provocation (M
23 $= 2.5$), than our female participants ($M = 3.7$), who competed in team sports. Athletes have a
24 tendency to perceive aggression as legitimate during competition (Bredemeier & Shields,

1 1986). Perhaps the higher aggression by athletic women in our sample provided more scope
2 for empathy to reduce aggression at low provocation compared to previous research.

3 At high provocation, empathy reduced aggression only in women, in line with previous
4 studies (Philips & Giancola, 2007; Richardson et al., 1994). Thus, the suppressing effect of
5 empathy on aggression was over-ridden at high provocation in men, but not in women.

6 Women may require higher provocation to neutralize the inhibitory role of empathy on
7 aggression, particularly during same-sex interactions (e.g., Richardson et al., 1994). It has
8 been suggested that female-female interactions may result in lower perceived threat in
9 relation to aggressive responding than male-male interactions (e.g., Richardson et al., 1994).

10 Accordingly, women may have interpreted high provocation as lower threat than men,
11 thereby enabling perspective taking to suppress aggression as well as potentially prime them
12 to conform to their social gender role. In contrast, men who were competing against other
13 men, and whose social role is oriented around instrumental traits (e.g., superiority), may have
14 interpreted high provocation as high threat, thereby behaving more impulsively and
15 overriding the ability for perspective taking to mitigate aggression (Richardson et al., 1994;
16 Zillmann, 1988). In sum, our findings indicate that empathy can reduce reactive aggression
17 in team sport athletes in competition. However, the suppressing effect of empathy on
18 aggression occurs only in women at high provocation.

19 **The Mediating Role of Emotion**

20 We examined two emotions as potential mediators of the effect of empathy on
21 aggression: guilt and anger. Guilt explained the suppressive effect of empathy on aggression,
22 but this effect was moderated by gender and provocation. Specifically, at low provocation,
23 guilt mediated the effect of empathy on aggression in men but not in women. There was no
24 mediation effect at high provocation. This could be attributed to the suppressing effect of
25 empathy on aggression being over-ridden. Therefore, our findings suggest that empathy can

1 lead to guilt in sportsmen under low provocation, but the self-regulatory role of empathy and
2 guilt on aggression is neutralized at high provocation.

3 These findings are in line with evidence that empathy is positively linked with guilt
4 (Leith & Baumeister, 1998; Tangney et al., 2007), which has been associated with lower
5 aggression (Stuewig et al., 2010; Tangney et al., 2007). Thus, in men, empathy increases
6 feelings of guilt about potentially harming another, which in turn, should help them refrain
7 from committing aggressive acts in the future. However, when provoked, men may blame
8 the provocateur, and this may explain why the role of guilt as an empathic response in the
9 regulation of aggressive conduct was neutralised at high provocation (cf. Bandura, 1991;
10 Stanger et al., 2013). Future research should identify the factors that mediate the effect of
11 empathy on aggression in sportswomen.

12 Contrary to our hypothesis, empathy did not influence anger, perhaps due to the
13 experimental task and the perceived intentionality of aggression by the opponent.
14 Specifically, participants were informed of the shock intensity that they received on losing
15 trials, which they believed was chosen by their opponent. This was an intentional behavior
16 by the “opponent”, and participants may have felt that their opponent was trying to hurt them
17 as only a small proportion of losing trials resulted in the lowest intensity shocks (i.e., shock
18 level 1). Thus, participants “knew” that their opponent was intentionally selecting the higher
19 intensity shocks. When aggression is perceived as intentional, individuals experience
20 reduced empathic reactions as well as increased anger (Betancourt & Blair, 1992). Thus,
21 empathy may not reduce anger during competition among individuals from team sports when
22 they perceive that they are provoked intentionally by an opponent.

23 **Practical Implications**

24 Our findings have some practical implications. First, they suggest that empathy could
25 reduce aggression under conditions of low provocation regardless of one’s gender, and at

1 high provocation, in women. Several studies have shown that empathy can be enhanced
2 using the appropriate training. For example, similar to previous research (e.g., Pecukonis,
3 1990), athletes could be presented with video-taped real-match situations involving
4 aggressive behaviors, asked to try to take the other person's perspective, imagine how he or
5 she feels, and think about the implications that these actions might have for others. Such
6 experiences could enhance athletes' empathy, thereby reducing their frequency of aggressive
7 behavior. Second, given that provocation increased anger for both genders and negated the
8 suppressing effect of empathy on aggression in men, practitioners could teach strategies to
9 reduce emotional arousal associated with perceived interpersonal provocation, such as
10 cognitive restructuring and attribution training. Such strategies may need to be considered in
11 conjunction with empathy training to reduce provoked aggression, particularly for men.

12 **Limitations of the Study and Directions for Future Research**

13 Although this research has revealed some novel findings, it also has some limitations,
14 which should be considered when interpreting our findings. First, we measured aggression
15 during the TAP, which is performed in the laboratory, has received extensive support for its
16 validity (e.g., Giancola & Parrott, 2008), and involves a competitive motor task performed
17 under different levels of provocation. Although our task contained some elements found in
18 sport (movement, competition, provocation), and our findings have high internal validity,
19 their generalizability to real-world contexts needs to be further investigated. Future research
20 examining aggression should employ a more ecologically valid task in the laboratory, modify
21 the TAP to simulate real world sport, and conduct a field experiment to determine whether
22 the current findings are replicated in real sport contexts.

23 Second, our study investigated aggression in same-sex dyads, a feature that simulated
24 competitive sport, where athletes typically compete against individuals of the same sex.
25 Therefore, our results can only be generalized to same-sex dyads. We do not know how

participants would respond if they were told they were competing against someone of the opposite sex. Future research should examine this issue. It is also possible that the effects of empathy differ based on the relationship with the opponent (e.g., Archer & Latham, 2004), or other characteristics of the opponent, such as the opponents' perceived level of harmful intent (Archer, 2004). It would be interesting to determine the extent to which empathy mitigates aggression, when the relationship with the opponent, levels of perceived intentionality, and the importance of the event, vary.

Given the experimental design of the study, an inherent limitation is the potential for demand characteristics. For instance, completion of certain measures (e.g., assessing anger and guilt) may have led participants to try and guess the true nature of our study, which could have influenced their responses. However, this was minimised with the deception protocol, and in the post-task interview, where we checked that participants perceived that they were competing against an opponent. Finally, our findings could be extended by investigating the effects of empathy training in competitive sport.

Conclusion

Our experiment has shown that empathy reduces aggression in men and women and provided novel evidence that guilt plays a role in explaining some of these effects, especially in men. Provocation led to less guilt about aggressing and more anger, making aggressive conduct more likely. Our findings underscore the importance of emotion in regulating reactive aggression. They show that empathy could be beneficial in tackling aggression in athletes, although its effects differ depending on gender and level of provocation.

References

- Archer, J. (2004). Sex differences in aggression in real-world settings: a meta-analytic review. *Review of General Psychology*, 8, 291-211. doi:10.1037/1089-2680.8.4.291
- Archer, J., & Latham, M. (2004). Variation in beliefs about aggression as a function of relationship to the opponent. *Personality and Individual Differences*, 37, 33-41. doi:10.1016/j.paid.2003.08.025
- Bandura, A. (1991). Social cognitive theory of moral thought and action. In W. M. Kurtines, and J. L. Gewirtz, *Handbook of moral behavior and development: Theory, research, and applications* (pp. 71-129). Hillsdale, NJ: Lawrence Erlbaum.
- Baron, R., & Richardson, D. (1994). *Human aggression* (2nd ed.). New York: Plenum Press.
- Batson, C. D., Early, S., & Salvarani, G. (1997). Perspective taking: Imagining how another feels versus imagining how you would feel. *Personality and Social Psychology Bulletin*, 23, 751-758. doi: 10.1177/0146167297237008
- Berkowitz, L. (1989). Frustration-aggression hypothesis: examination and reformulation. *Psychological Bulletin*, 106, 410-427. doi:10.1037/0033-2909.106.1.59
- Betancourt, H., & Blair, I. (1992). A cognition (attribution) - emotion model of violence in conflict situations. *Personality and Social Psychology Bulletin*, 18, 343-350. doi:10.1177/0146167292183011
- Bettencourt, A. A., & Miller, N. (1996). Gender differences in aggression as a function of provocation: A meta-analysis. *Psychological Bulletin*, 119, 422-447. doi:10.1037//0033-2909.119.3.422
- Bond, A., & Lader, M. (1986). A method to elicit aggressive feelings and behavior via provocation. *Biological Psychology*, 22, 69-79. doi:10.1016/0301-0511(86)90021-9
- Bredemeier, B. J., & Shields, D. L. (1986). Athletic aggression: an issue of contextual morality. *Sociology of Sport Journal*, 3, 15-28.

- 1 Cacioppo, J.T., Berntson, G.G., Larsen, J.T., Poehlmann, K.M. & Ito, T.A. (2000). The
2 psychophysiology of emotion. In: M. Lewis & J.M. Haviland-Jones (Eds.), *Handbook*
3 *of emotions* (pp. 173–191). New York: Guilford Press.
- 4 Cohen, J. (1992). A power primer. *Psychological Bulletin*, 112, 155-159.
- 5 Cooke, A., Kavussanu, M., McIntyre, D., & Ring, C. (2013). The effects of individual and
6 team competitions on performance, emotions and effort. *Journal of Sport & Exercise*
7 *Psychology*, 35, 132-143.
- 8 Davis, M. H. (1980). A multidimensional approach to individual differences in empathy.
9 *JSAS Catalog of Selected Documents in Psychology*, 10, 85.
- 10 Decety, J., & Cowell, J. (2014). The complex relation between morality and empathy. *Trends*
11 *in Cognitive Sciences*, 18, 337-339. doi:10.1016/j.tics.2014.04.008
- 12 Eagly, A. (1987). *Sex differences in social behaviour: A social role interpretation*. Hillsdale,
13 New Jersey: Erlbaum.
- 14 Edwards, L., Ring, C., McIntyre, D., & Carroll, D. (2001). Modulation of the human
15 nociceptive flexion reflex across the cardiac cycle. *Psychophysiology*, 38, 712–718.
16 doi:10.1111/1469-8986.3840712
- 17 Eisenberg, N. (2000). Emotion, regulation, and moral development. *Annual Review of*
18 *Psychology*, 51, 665-697. doi:10.1146/annurev.psych.51.1.665
- 19 Eisenberg, N., & Lennon, R. (1983). Sex differences in empathy and related capacities.
20 *Psychological Bulletin*, 94, 100-131. doi:10.1037/0033-2909.94.1.100
- 21 Feshbach, N. D. (1975). Empathy in children: some theoretical and empirical considerations.
22 *The Counseling Psychologist*, 5, 25-30. doi:10.1177/001100007500500207
- 23 Giancola, P.R. (2003). The moderating effects of dispositional empathy on alcohol-related
24 aggression in men and women. *Journal of Abnormal Psychology*, 112, 275-281.
25 doi:10.1037/0021-843X.112.2.275

- 1 Giancola, P. R., & Parrott, D. J. (2008). Further evidence for the validity of the Taylor
2 Aggression Paradigm. *Aggressive Behavior*, 34, 214-229. doi:10.1002/ab.20235
- 3 Hayes, A. F. (2009). Beyond Baron & Kenny: Statistical mediation analysis in the new
4 millennium. *Communication Monographs*, 76, 408-420.
5 doi:10.1080/03637750903310360
- 6 Hayes, A. F. (2013). *Introduction to mediation, moderation and conditional process analysis:*
7 *A regression-based approach*. New York, NY: Guilford-Press.
- 8 Hayes, A. F. (2015). An index and test of linear moderated mediation. *Multivariate*
9 *Behavioral Research*, 50, 1-22. doi:10.1080/00273171.2014.962683
- 10 Hoaken, P. N. S., Campbell, T., Stewart, S. H., & Pihl, R. O. (2003). Effects of alcohol on
11 cardiovascular reactivity and the mediation of aggressive behavior in adult men and
12 women. *Alcohol & Alcoholism*, 38, 84-92. doi:10.1093/alcalc/agg022
- 13 Hoffman, M. L. (2000). *Empathy and moral development, implications for caring and justice*.
14 Cambridge University Press, UK.
- 15 Jolliffe, D., & Farrington, D. P. (2004). Empathy and offending: A systematic review and
16 meta-analysis. *Aggression and Violent Behavior*, 9, 441-476.
17 doi:10.1016/j.avb.2003.03.001
- 18 Jones, M. V., Lane, A. M., Bray, S. R., Uphill, M., & Catlin, J. (2005). Development and
19 validation of the sport emotion questionnaire. *Journal of Sport & Exercise Psychology*,
20 27, 407-431.
- 21 Kaube, H., Katsarava, Z., Käufer, T., Diener, H. & Ellrich, J. (2000). A new method to
22 increase nociception specificity of the human blink reflex. *Clinical Neurophysiology*,
23 111, 413-416. doi:10.1016/S1388-2457(99)00295-3
- 24 Kavussanu, M., & Boardley, I. D. (2009). The Prosocial and Antisocial Behavior in Sport
25 Scale. *Journal of Sport & Exercise Psychology*, 31, 97-117.

- 1 Kavussanu, M., Boardley, I. D., Sagar, S. S., & Ring, C. (2013). Bracketed morality revisited:
2 How do athletes behave in two contexts? *Journal of Sport & Exercise Psychology*, 35,
3 449-463.
- 4 Kavussanu, M., & Ring, C. (2015). Moral thought and action in sport and student life: A
5 study of bracketed morality. *Ethics & Behavior*. doi:10.1080/10508422.2015.1012764
- 6 Kavussanu, M., Stamp, R., Slade, G., & Ring, C. (2009). Observed prosocial and antisocial
7 behaviors in male and female soccer players. *Journal of Applied Sport Psychology*, 21,
8 S62-S76. doi:10.1080/10413200802624292
- 9 Kavussanu, M., Stanger, N., & Boardley, I. D. (2013). The prosocial and antisocial behaviour
10 in sport scale: Further evidence for construct validity and reliability. *Journal of Sports*
11 *Sciences*, 31, 1208-1221. doi:10.1080/02640414.2013.775473
- 12 Leith, K. P., & Baumeister, R. F. (1998). Empathy, shame, guilt, and narratives of
13 interpersonal conflicts: Guilt-prone people are better at perspective taking. *Journal of*
14 *Personality*, 66, 1-37.
- 15 Marschall, D. E., Saftner, J. & Tangney, J. P. (1994). *The state shame and guilt scale*.
16 Fairfax, VA: George Mason University.
- 17 Maxwell, J. P. (2004). Anger rumination: an antecedent of athlete aggression? *Psychology of*
18 *Sport & Exercise*, 5, 279-289. doi:10.1016/S1469-0292(03)00007-4
- 19 Maxwell, J. P., Visek, A. J., & Moores, E. (2009). Anger and perceived legitimacy of
20 aggression in male Hong Kong Chinese athletes: Effects of type of sport and level of
21 competition. *Psychology of Sport and Exercise*, 10, 289-296.
22 doi:10.1016/j.psychsport.2008.07.010
- 23 Miller, P. A., & Eisenberg, N. (1988). The relation of empathy to aggressive and
24 externalizing/ antisocial behavior. *Psychological Bulletin*, 103, 324-344.
25 doi:10.1037//0033-2909.103.3.324

EMPATHY, EMOTION AND AGGRESSION

26

- 1 Mohr, P., Howells, K., Gerace, A., Day, A., & Wharton, M. (2007). The role of perspective
2 taking in anger arousal. *Personality and Individual Differences*, 43, 507-517. doi:
3 10.1016/j.paid.2006.12.019
- 4 Novaco, R. (1997). Remediating anger and aggression with violent offenders. *Legal and*
5 *Criminological Psychology*, 2, 77-88. doi:10.1111/j.2044-8333.1997.tb00334.x
- 6 Parrott, D.J., Zeichner, A., & Stephens, D. (2003). Effects of alcohol, personality, and
7 provocation on the expression of anger in men: A facial coding analysis. *Alcoholism:*
8 *Clinical & Experimental Research*, 27, 937-945. doi:10.1111/j.1530-
9 0277.2003.tb04418.x
- 10 Pecukonis, E.V. (1990). A cognitive/affective empathy training program as a function of ego
11 development in aggressive adolescent females. *Adolescence*, 25, 59-76.
- 12 Phillips, J.P., & Giancola, P.R. (2007). The effects of contextual empathy on aggressive
13 behavior in men and women. In A.M. Columbus (Ed.), *Advances in psychology*
14 *research*, Vol. 49 (pp. 197-208). Hauppauge, NY: Nova Science Publishers, Inc.
- 15 Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect
16 effects in simple mediation models. *Behavior Research Methods, Instruments, &*
17 *Computers*, 36, 717-731. doi:10.3758/BF03206553
- 18 Prinz, J. (2006). The emotional basis of moral judgments. *Philosophical Explorations*, 9, 29-
19 43. doi:10.1080/13869790500492466
- 20 Richardson, D. R., Hammock, G. S., Smith, S. M., Gardner, W., & Signo, M. (1994).
21 Empathy as a cognitive inhibitor of interpersonal aggression. *Aggressive Behavior*, 20,
22 275-289. doi:10.1002/1098-2337(1994)20:4<275::AID-AB2480200402>3.0.CO;2-4
- 23 Stanger, N., Kavussanu, M., Boardley, I. D., & Ring, C. (2013). The influence of moral
24 disengagement and negative emotion on antisocial sport behavior. *Sport, Exercise and*
25 *Performance Psychology*, 2, 117-129. doi:10.1037/a0030585

- 1 Stanger, N., Kavussanu, M., & Ring, C. (2012). Put yourself in their boots: Effects of
2 empathy on emotion and aggression. *Journal of Sport & Exercise Psychology*, 34, 208-
3 222.
- 4 Stemmler, G. (2010). Somatovisceral activation during anger. In M. Potegal., G. Stemmler,
5 and C. Spielberger (Eds), *International Handbook of Anger* (pp. 103-121). New York:
6 Springer
- 7 Stuewig, J., Tangney, J. P., Heigel, C., Harty, L., & McCloskey, L. (2010). Shaming, blaming
8 and maiming: Functional links among the moral emotions, externalization of blame,
9 and aggression. *Journal of Research in Personality*, 44, 91-102.
10 doi:10.1016/j.jrp.2009.12.005
- 11 Tangney, J. P., Stuewig, J., & Mashek, D. J. (2007). Moral emotions and moral behavior.
12 *Annual Review of Psychology*, 58, 345-372.
13 doi:10.1146/annurev.psych.56.091103.070145
- 14 Taylor, S. P. (1967). Aggressive behavior and physiological arousal as a function of
15 provocation and the tendency to inhibit aggression. *Journal of Personality*, 35, 297-
16 310. doi:10.1111/j.1467-6494.1967.tb01430.x
- 17 Vachon, D. D., Lynam, D. R., & Johnson, J. A. (2014). The (non) relation between empathy
18 and aggression: Surprising results from a meta-analysis. *Psychological Bulletin*, 140,
19 751-773. doi:10.1037/a0035236
- 20 Zillmann, D. (1988). Cognitive-excitation interdependencies in aggressive behavior.
21 *Aggressive Behavior*, 14, 51-64. doi:10.1002/1098-2337(1988)14:1<51::AID-
22 AB2480140107>3.0.CO ;2-C

Endnotes

¹ Due to the number of reported analyses, readers may wish to make statistical adjustments (e.g., Bonferroni corrections) to our findings. Partial eta-squared (η_p^2) is reported, which equals the adjusted R^2 obtained in regression analyses (Tabachnick & Fidell, 2007); values of .02, .13 and .26 for η_p^2 indicate small, medium and large effect sizes, respectively (Cohen, 1992).

² Heart rate and skin conductance have been associated with fear and anxiety – in addition to anger - in previous research (e.g., Stemmler, 2010). Therefore, we measured participants' self-reported fear and anxiety to check whether these physiological measures were more reflective of anger than fear and anxiety during the task. Fear was assessed using five adjectives (scared, afraid, frightened, fearful and panicked), while anxiety was measured with five adjectives (anxious, apprehensive, nervous, tense and uneasy) from the Sport Emotion Questionnaire (Jones et al., 2005). Results revealed that fear did not change from low ($M = 1.53$, $SD = 0.67$) to high ($M = 1.54$, $SD = 0.73$) provocation, $F(1, 76) = 0.052$, $p = .82$, $\eta_p^2 = .00$. Similarly, anxiety did not change from low ($M = 2.27$, $SD = 0.88$) to high ($M = 2.24$, $SD = 0.93$) provocation, $F(1, 79) = 0.325$, $p = .57$, $\eta_p^2 = .00$. Thus, in line with previous studies using the TAP, these measures were reflective of anger during this experimental task (e.g., Bond & Lader, 1986; Parrott et al., 2003).

1 Acknowledgements

2 [REDACTED]

3 [REDACTED]

4

5

6

7

For Peer Review

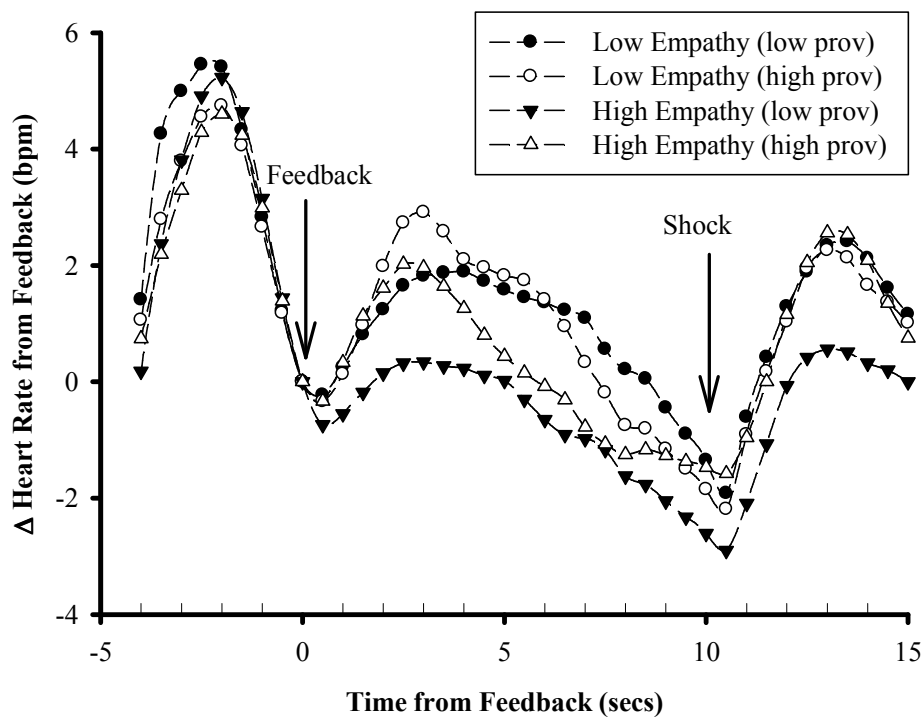


Figure 1. Heart rate change (bpm) as a function of time from feedback on losing trials for low and high empathy groups during low and high provocation.

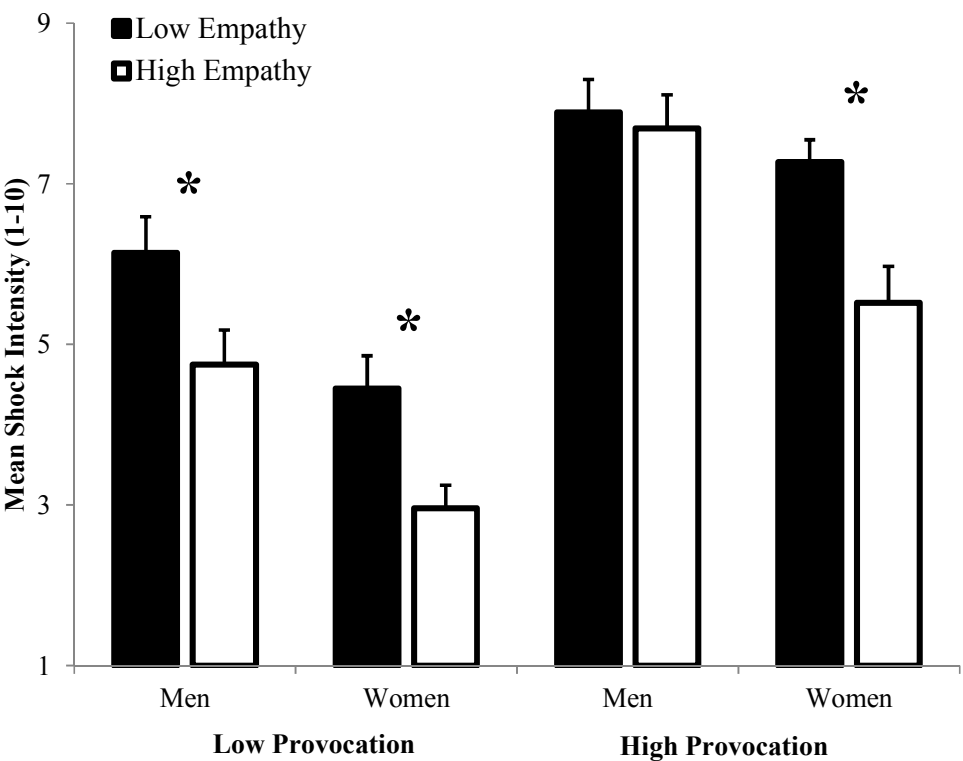


Figure 2. Mean (SE) intensity shock selection for men and women in the low and high empathy groups during low and high provocation.

* $p < .05$.

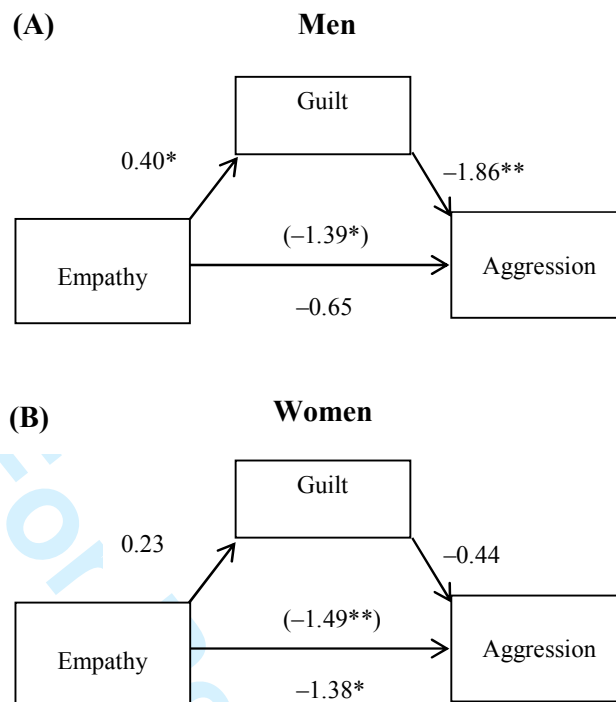


Figure 3. Guilt mediated the effect of empathy on aggression at low provocation in men (A), but not in women (B). Unstandardized regression coefficients are presented, and uncorrected coefficients are in brackets. Low empathy group was coded 0 and high empathy group was coded 1. * $p < .05$; ** $p < .01$.